

Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

Claims 1-12 (Canceled).

- 1 Claim 13 (New). A computer implemented method for creating or
2 modifying a drawing or database for representing a physical environment,
3 comprising the steps of:
 - 4 a) inputting into a computer one or more files, one or more raster
5 images, one or more vector data, one or more vectors, one or more
6 drawings, or one or more drawing objects which represent in a computer
7 representation all or part of a physical environment in which an in-building
8 or campus communications network may be deployed, said computer
9 representation providing representations of one or more of floors, walls,
10 partitions, buildings, building complexes or compounds, terrain, foliage, or
11 other sites or obstructions;
 - 12 b) using a computer for creating, formatting, editing or
13 manipulating one or more objects in said computer representation;
 - 14 c) verifying, using a computer, the sufficiency of said one or more
15 objects to ensure a useful three dimensional definition of said physical
16 environment for use by a communications engineering or network
17 management application, and notifying a user of results of said verification
18 of sufficiency;
 - 19 d) generating at least one formatted drawing or database wherein
20 said at least one formatted drawing or database, or said one or more
21 objects, or one or more of electrical properties, physical properties,
22 aesthetic properties, and spatial configurations of said one or more objects
23 are transportable between users or between one or more communications
24 engineering or network management applications; and
 - 25 e) rendering a three dimensional visual representation of said

26 physical environment.

1 Claim 14 (new). The method of claim 13 wherein said notifying performed
2 in said verifying and notifying step is performed in an automatic fashion
3 without feedback being provided to the user.

1 Claim 15 (New). The method of claim 13 wherein said notifying
2 performed in said verifying and notifying step is performed by prompting
3 the user and, when required to provide said useful definition, requires the
4 user to correct any insufficiencies in response to an insufficiency
5 notification.

1 Claim 16 (New). The method of claim 13 wherein said communications
2 engineering or network management application is selected from the group
3 consisting of one or more of wireless propagation prediction, measurement
4 tools, component placement or layout visualization tools, optimization
5 tools, bill of materials generating tools, and network performance
6 management or prediction tools.

1 Claim 17 (New). The method of claim 13 further comprising the step of
2 adding or deleting at least one object in said at least one formatted drawing
3 or database.

1 Claim 18 (New). The method of claim 13 further comprising the step of
2 editing or modifying at least one object in said at least one formatted
3 drawing or database.

1 Claim 19 (New). The method of claim 13 further comprising the step of
2 moving at least one object in said at least one formatted drawing or
3 database.

1 Claim 20 (New). The method of claim 13 further comprising the step of

2 removing extraneous items from any of said one or more files, one or more
3 raster images, said one or more vector data, said one or more vectors, said
4 one or more drawings, said one or more drawing objects, or said at least
5 one formatted drawing or database.

1 Claim 21 (New). The method of claim 13 further comprising the step of
2 tracing and adding a traced object to said at least one formatted drawing or
3 database.

1 Claim 22 (New). The method of claim 21 wherein either or both of said
2 steps of tracing and adding are performed before said verifying step.

1 Claim 23 (New). The method of claim 13 further comprising modifying
2 at least one object of said one or more objects, or at least one of electrical
3 properties, physical properties, aesthetic properties, and spatial
4 configurations of at least one object.

1 Claim 24 (New). The method of claim 13 further comprising the step of
2 editing or modifying any of said one or more files, one or more raster
3 images, said one or more vector data, said one or more vectors, said one or
4 more drawings, said one or more drawing objects, or said at least one
5 formatted drawing or database.

1 Claim 25 (New). The method of claim 13 further comprising the step of
2 editing or modifying said at least one formatted drawing or database
3 generated in said generating step.

1 Claim 26 (New). The method of claim 13 further comprising the step of
2 removing extraneous objects from said one or more objects.

1 Claim 27 (New) The method of claim 13 further comprising the step of
2 tracing and adding data representing a traced object.

1 Claim 28 (New). The method of claim 13 further comprising the step of
2 adding measurement data to said at least one formatted drawing or
3 database.

1 Claim 29 (new). The method of claim 13 wherein said verifying step
2 produces a verified set of data, and further comprising the step of adding
3 measurement data to said verified set of data.

1 Claim 30 (new). The method of claim 13 further comprising the step of
2 specifying or invoking a propagation model for performing predictions of
3 performance.

1 Claim 31 (new). The method of claim 13 further comprising the step of
2 specifying or invoking a listing of communications equipment.

1 Claim 32 (new). The method of claim 13 further comprising the steps of
2 tracing and representing a traced object in a scaled database model of the
3 physical environment.

1 Claim 33 (new). The method of claim 13 wherein said at least one
2 formatted drawing or database generated in said generating step is in a
3 form transportable to and usable by one or more communications
4 engineering or network management applications.

1 Claim 34 (new). The method of claim 13 further comprising the step of
2 prompting a user to enter information required to verify there is sufficient
3 information to produce a verified set of data.

1 Claim 35 (New). The method of claim 34 wherein said prompting is
2 automatic or implicit.

1 Claim 36 (New). The method of claim 13 wherein said verifying step
2 produces a verified set of data, and wherein said verified set of data, or
3 said at least one formatted drawing or database, is transportable between
4 users or between one or more engineering design or management
5 applications.

1 Claim 37 (New). The method of claim 13 further comprising the step of
2 rendering a two dimensional view representative of said physical
3 environment.

1 Claim 38 (New). An apparatus for creating or modifying a transportable
2 database model of a physical environment for use with in-building
3 communications network design, measurement, management, layout, asset
4 management, or optimization applications, comprising:

5 computer implemented means for creating, formatting, editing, or
6 manipulating one or more objects defining an environment in which a
7 communications network may be deployed, said environment having one
8 or more of floors, walls, partitions, buildings, building complexes or
9 compounds, terrain, foliage, or other sites or obstructions;

10 means for generating at least one formatted drawing or formatted
11 set of data which represents one or more objects, wherein said one or more
12 objects or one or more of electrical properties, physical properties,
13 aesthetic properties, or spatial configurations of one or more objects within
14 said formatted drawing or formatted set of data can be transported between
15 users or between one or more communications engineering or network
16 management applications;

17 means for creating, formatting, editing, or manipulating one or
18 more of said at least one formatted drawing or formatted set of data, or
19 said one or more objects, or said properties or said configurations of said
20 one or more objects; and

21 means for rendering a three dimensional view representing said
22 environment.

1 Claim 39 (New). The apparatus of claim 38 further comprising means for
2 rendering a two dimensional view representing said environment.

1 Claim 40 (New). The apparatus of claim 38 further comprising a means
2 for verifying the sufficiency of said one or more objects to ensure a useful
3 definition of said environment and notifying said user of results of a
4 verification of sufficiency.

1 Claim 41 (New). The apparatus of claim 40 wherein notifying performed
2 by said means for verifying and notifying is performed in an automatic
3 fashion without feedback being provided to the user.

1 Claim 42 (New). The apparatus of claim 40 wherein notifying performed
2 by said means for verifying and notifying is performed by prompting the
3 user and, when required to provide said useful definition, requires the user
4 to correct any insufficiencies in response to an insufficiency notification.

1 Claim 43 (New). The apparatus of claim 38 further comprising a means
2 for adding measurement data to said at least one formatted drawing or
3 formatted set of data or said one or more objects.

1 Claim 44 (New). The apparatus of claim 38 further comprising means for
2 specifying or invoking a propagation model for performing predictions of
3 performance.

1 Claim 45 (New). The apparatus of claim 38 further comprising a means
2 for specifying or invoking a listing of communications equipment.

- 1 Claim 46 (New). A computerized system for creating or modifying a
2 drawing or database for representing a physical environment, comprising:
3 means for inputting into a computer one or more files, one or more
4 raster images, one or more vector data, one or more vectors, one or more
5 drawings, or one or more drawing objects which represent in a computer
6 representation all or part of a physical environment in which an in-building
7 or campus communications network may be deployed, said computer
8 representation providing representations of one or more of floors, walls,
9 partitions, buildings, building complexes or compounds, terrain, foliage, or
10 other sites or obstructions;
- 11 means for using a computer for creating, formatting, editing or
12 manipulating one or more objects in said computer representation;
- 13 means for verifying, using a computer, the sufficiency of said one
14 or more objects to ensure a useful three dimensional definition of said
15 physical environment for use by a communications engineering or network
16 management application, and notifying a user of results of said verification
17 of sufficiency;
- 18 means for generating at least one formatted drawing or database
19 wherein said at least one formatted drawing or database, or one or more
20 objects or one or more of electrical properties, physical properties,
21 aesthetic properties, or spatial configurations of said one or more objects
22 are transportable between users or between one or more communications
23 engineering or network management applications; and
- 24 means for rendering a three dimensional visual representation of
25 said physical environment.
- 1 Claim 47 (New). The computerized system of claim 46 wherein said
2 notifying performed by said means for verifying and notifying is performed
3 in an automatic fashion without feedback being provided to the user.
- 1 Claim 48 (New). The computerized system of claim 46 wherein said

2 notifying performed by said means for verifying and notifying is performed
3 by prompting the user and, when required to provide said useful definition,
4 requires the user to correct any insufficiencies in response to an
5 insufficiency notification.

1 Claim 49 (New). The computerized system of claim 46 wherein said
2 communications engineering or network management application is
3 selected from the group consisting of one or more of wireless propagation
4 prediction, measurement tools, component placement or layout
5 visualization tools, optimization tools, bill of materials generating tools,
6 and network performance management or prediction tools.

1 Claim 50 (New). The computerized system claim 46 further comprising
2 means for adding or deleting at least one object in said at least one
3 formatted drawing or database.

1 Claim 51 (New). The computerized system of claim 46 further
2 comprising means for editing or modifying at least one object in said at
3 least one formatted drawing or database.

1 Claim 52 (New). The computerized system of claim 46 further
2 comprising means for moving at least one object in said at least one
3 formatted drawing or database.

1 Claim 53 (New). The computerized system of claim 46 further
2 comprising means for removing extraneous items from any of said one or
3 more files, one or more raster images, said one or more vector data, said
4 one or more vectors, said one or more drawings, said one or more drawing
5 objects, or said at least one formatted drawing or database.

1 Claim 54 (New). The computerized system of claim 46 further

2 comprising means for tracing and adding a traced object to said at least one
3 formatted drawing or database.

1 Claim 55 (New). The computerized system of claim 54 wherein said
2 means of tracing and adding performs either or both tracing or adding
3 before verifying with said means for verifying.

1 Claim 56 (New). The computerized system of claim 46 further comprising
2 at least one of means for specifying or invoking a propagation model for
3 performing predictions of performance, or means for specifying or
4 invoking a listing of communications equipment.

1 Claim 57 (New). The computerized system of claim 46 further
2 comprising means for modifying at least one object of said one or more
3 objects, or at least one of electrical properties, physical properties,
4 aesthetic properties, and spatial configurations of said at least one object.

1 Claim 58 (New). The computerized system of claim 46 further
2 comprising means editing or modifying any of said one or more files, one
3 or more raster images, said one or more vector data, said one or more
4 vectors, said one or more drawings, said one or more drawing objects, or
5 said at least one formatted drawing or database.

1 Claim 59 (New). The computerized system of claim 46 further
2 comprising a means for editing or modifying said at least one formatted
3 drawing or database generated by said means for generating.

1 Claim 60 (New). The computerized system of claim 46 further comprising
2 means for removing extraneous objects from said one or more objects.

1 Claim 61 (New) The computerized system of claim 46 further comprising
2 means for tracing and adding data representing a traced object.

1 Claim 62 (New). The computerized system of claim 46 wherein said
2 means for verifying produces a verified set of data, and further comprising
3 means for adding measurement data to said verified set of data, or said at
4 least one formatted drawing or database.

1 Claim 63 (New). The computerized system of claim 46 further comprising
2 means for tracing and representing a traced object in a scaled database
3 model of the physical environment.

1 Claim 64 (New). The computerized system of claim 63 wherein said
2 means for tracing and representing performs either or both tracing or
3 representing before verifying with said means for verifying.

1 Claim 65 (new). The computerized system of claim 46 wherein said at
2 least one formatted drawing or database generated by said means for
3 generating is in a form transportable to and usable by one or more
4 communications engineering or network management applications.

1 Claim 66 (new). The computerized system of claim 46 further comprising
2 means for prompting a user to enter information required to verify there is
3 sufficient information to produce a verified set of data.

1 Claim 67 (new). The computerized system of claim 66 wherein said
2 prompting is automatic or implicit.

1 Claim 68 (new). The computerized system of claim 46 wherein said
2 means for verifying produces a verified set of data and wherein said
3 verified set of data, or said at least one formatted drawing or database is

4 transportable between users or between one or more engineering design or
5 management applications.

1 Claim 69 (new). The computerized system of claim 46 further comprising
2 means for rendering a two dimensional view representative of said
3 physical environment.

1 Claim 70 (New). A computer implemented method for constructing a
2 communications network database, comprising the steps of:

3 using a computer for creating, formatting, editing or manipulating
4 one or more objects used in a computer representation of an environment
5 in which an in-building or campus communications network may be
6 deployed, said environment having one or more of floors, walls, partitions,
7 buildings, building complexes or compounds, terrain, foliage, or other sites
8 or obstructions;

9 verifying, using a computer, the sufficiency of said one or more
10 objects by performing any of the following:

11 (i) removing unused and un-referenced objects from said one or
12 more objects;

13 (ii) removing unnecessary data selected from the group consisting
14 of legends, initials, maps, map layers, text, and extraneous drawing
15 objects;

16 (iii) objects have been assigned attenuation factors;

17 (iv) objects have been assigned colors;

18 (v) objects have been assigned physical or electrical information;

19 (vi) intersection of objects with floors, ceilings and other objects
20 have been located;

21 (vii) buildings are aligned with terrain;

22 (viii) floors of a building are aligned with one another;

23 (ix) determining if database has been verified previously;

24 (x) determining if database is newly created, altered, modified,

25 amended, edited, previously formatted or not previously formatted;
26 (xi) specifying at least one reference point;
27 (xii) scaling one or more objects of said one or more objects
28 (xiii) scaling a raster image;
29 (xiv) adding measurements at site specific locations;
30 (xv) creating a legend for the drawing;
31 (xvi) creating a boundary around drawing;
32 (xvii) specifying or invoking communications equipment listings;
33 (xviii) specifying or invoking a propagation model for performing
34 predictions of performance;
35 (xix) specifying an air interface standard or operating frequency;
36 and
37 generating either
38 (A) an editable database or one or more editable drawings wherein
39 one or more of said objects or one or more of electrical properties, physical
40 properties, aesthetic properties, and spatial configurations of one or more
41 objects within said editable database or said one or more editable drawings
42 can be altered, or
43 (B) a set of formatted data or one or more formatted drawings in a
44 form transportable to and usable by other users, or one or more
45 communications engineering or network management applications; and
46 rendering a three-dimensional view representing said environment.

1 Claim 71 (New). The method of claim 70 further comprising the step of
2 grouping a number of said one or more objects.

1 Claim 72 (New). The method of claim 70 further comprising the step of
2 adding measurement data to one or more of said one or more objects or
3 one or more of said editable drawings, said editable database, said
4 formatted data, or said formatted drawing.

1 Claim 73 (New). The method of claim 70 further comprising the step of
2 notifying a user of the sufficiency of said one or more objects.

1 Claim 74 (New). The method of claim 73 wherein said step of notifying
2 is performed in an automatic fashion without feedback being provided to
3 the user.

1 Claim 75 (New). The method of claim 73 wherein said step of notifying
2 is performed by prompting the user and, when required to provide said
3 useful definition, requires the user to correct any insufficiencies in
4 response to an insufficiency notification.

1 Claim 76 (New). The method of claim 70 further comprising the step of
2 scaling one or more of said editable database, said one or more editable
3 drawings, said set of formatted data, or said one or more formatted
4 drawings.

1 Claim 77 (New). The method of claim 70 wherein said generating step
2 generates one or more of said editable database, said one or more editable
3 drawings, said set of formatted data, or said one or more formatted
4 drawings in a form transportable to and usable by a communications
5 engineering or network management application.

1 Claim 78 (New). The method of claim 77 wherein said communications
2 engineering or network management application is selected from the group
3 consisting of wireless propagation models, measurement tools, component
4 placement or layout visualization tools, optimization tools, bill of materials
5 generating tools, and network performance management or prediction
6 tools.

1 Claim 79 (New). The method of claim 70 wherein step (i) is performed

2 during said verifying step.

1 Claim 80 (New). The method of claim 70 wherein step (ii) is performed
2 during said verifying step.

1 Claim 81 (New). The method of claim 70 wherein step (iii) is performed
2 during said verifying step.

1 Claim 82 (New). The method of claim 70 wherein step (iv) is performed
2 during said verifying step.

1 Claim 83 (New). The method of claim 70 wherein step (v) is performed
2 during said verifying step.

1 Claim 84 (New). The method of claim 70 wherein step (vi) is performed
2 during said verifying step.

1 Claim 85 (New). The method of claim 70 wherein step (vii) is performed
2 during said verifying step.

1 Claim 86 (New). The method of claim 70 wherein step (viii) is performed
2 during said verifying step.

1 Claim 87 (New). The method of claim 70 wherein step (ix) is performed
2 during said verifying step.

1 Claim 88 (New). The method of claim 70 wherein step (x) is performed
2 during said verifying step.

1 Claim 89 (New). The method of claim 70 wherein step (xi) is performed
2 during said verifying step.

1 Claim 90 (New). The method of claim 70 wherein step (xii) is performed
2 during said verifying step.

1 Claim 91 (New). The method of claim 70 wherein step (xiii) is performed
2 during said verifying step.

1 Claim 92 (New). The method of claim 70 wherein step (xiv) is performed
2 during said verifying step.

1 Claim 93 (New). The method of claim 70 wherein step (xv) is performed
2 during said verifying step.

1 Claim 94 (New). The method of claim 70 wherein step (xvi) is performed
2 during said verifying step.

1 Claim 95 (New). The method of claim 70 wherein step (xvii) is
2 performed during said verifying step.

1 Claim 96 (New). The method of claim 70 wherein step (xviii) is
2 performed during said verifying step.

1 Claim 97 (New). The method of claim 70 wherein step (xix) is performed
2 during said verifying step.

1 Claim 98 (New). The method of claim 70 further comprising the step of
2 specifying or invoking a propagation model for performing predictions of
3 performance.

1 Claim 99 (New). The method of claim 70 further comprising the step of
2 specifying or invoking a listing of communications equipment.

1 Claim 100 (New). An apparatus for constructing a communications
2 network database, comprising:

3 computer implemented means for creating, formatting, editing or
4 manipulating one or more objects used in a computer representation of an
5 environment in which an in-building or campus communications network
6 may be deployed, said environment having one or more of floors, walls,
7 partitions, buildings, building complexes or compounds, terrain, foliage, or
8 other sites or obstructions;

9 means for verifying, using a computer, the sufficiency of said one
10 or more objects by performing any of the following:

11 (i) removing unused and un-referenced objects from said one or
12 more objects;

13 (ii) removing unnecessary data selected from the group consisting
14 of legends, initials, maps, map layers, text, and extraneous drawing
15 objects;

16 (iii) objects have been assigned attenuation factors;

17 (iv) objects have been assigned colors;

18 (v) objects have been assigned physical or electrical information;

19 (vi) intersection of objects with floors, ceilings and other objects
20 have been located;

21 (vii) buildings are aligned with terrain;

22 (viii) floors of a building are aligned with one another;

23 (ix) determining if database has been verified previously;

24 (x) determining if database is newly created, altered, modified,
25 amended, edited, previously formatted or not previously formatted;

26 (xi) specifying at least one reference point;

27 (xii) scaling one or more objects of said one or more objects;

28 (xiii) scaling a raster image;

29 (xiv) adding measurements at site specific locations;

30 (xv) creating a legend for the drawing;

31 (xvi) creating a boundary around drawing;
32 (xvii) specifying or invoking communications equipment listings;
33 (xviii) specifying or invoking a propagation model for performing
34 predictions of performance;
35 (xix) specifying an air interface standard or operating frequency;
36 and
37 means for generating either
38 (A) an editable database or one or more editable drawings wherein
39 one or more of said objects or one or more of electrical properties, physical
40 properties, aesthetic properties, or spatial configurations of one or more
41 objects within said editable database or said one or more editable drawings
42 can be altered, or
43 (B) a set of formatted data or one or more formatted drawings in a
44 form transportable to and usable by others or one or more communications
45 engineering or network management applications; and
46 means for rendering a three dimensional view representing said
47 environment.

1 Claim 101 (New). The apparatus of claim 100 further comprising means
2 for grouping a number of said one or more objects.

1 Claim 102 (New). The apparatus of claim 100 further comprising means
2 for adding measurement data to one or more of said one or more objects

1 Claim 103 (New) The apparatus of claim 100 further comprising means
2 for notifying a user of the sufficiency of said one or more objects.

1 Claim 104 (New). The apparatus of claim 103 wherein said means for
2 notifying functions in an automatic fashion without feedback being
3 provided to the user.

1 Claim 105 (New). The apparatus of claim 103 wherein said means for
2 notifying functions by prompting the user and, when required to provide
3 said useful definition, requires the user to correct any insufficiencies in
4 response to an insufficiency notification.

1 Claim 106 (New). The apparatus of claim 100 further comprising a means
2 for scaling one or more of said editable database, said one or more editable
3 drawings, said set of formatted data, or said one or more formatted
4 drawings.

1 Claim 107 (New). The apparatus of claim 100 wherein said means for
2 generating generates one or more of said editable database, said one or
3 more editable drawings, said set of formatted data, or said one or more
4 formatted drawings in a form transportable to and usable by a
5 communications engineering or network management application.

1 Claim 108 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (i).

1 Claim 109 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (ii).

1 Claim 110 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (iii).

1 Claim 111 (New.) The apparatus of claim 100 wherein said means for
2 verifying performs function (iv).

1 Claim 112 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (v).

1 Claim 113 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (vi).

1 Claim 114 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (vii).

1 Claim 115 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (viii).

1 Claim 116 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (ix).

1 Claim 117 (New). The apparatus of claim 100 wherein said means for
2 verifying performs function (x).

1 Claim 118 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xi).

1 Claim 119 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xii).

1 Claim 120 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xiii).

1 Claim 121 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xiv).

1 Claim 122 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xv).

1 Claim 123 (New). The apparatus of claim 100 wherein said means for

2 verifying performs (xvi).

1 Claim 124 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xvii).

1 Claim 125 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xviii).

1 Claim 126 (New). The apparatus of claim 100 wherein said means for
2 verifying performs (xix).

1 Claim 127 (New). The apparatus of claim 100 further comprising means
2 for adding measurement data to one or more of said editable database, said
3 one or more editable drawings, said set of formatted data, or said one or
4 more formatted drawings.

1 Claim 128 (New). The method of claim 100 further comprising means for
2 scaling one or more of said editable database, said one or more editable
3 drawings, said set of formatted data, or said one or more formatted
4 drawings.

1 Claim 129 (New). The apparatus of claim 100 further comprising means
2 for specifying or invoking a propagation model for performing predictions
3 of performance.

1 Claim 130 (New). The apparatus of claim 100 further comprising a means
2 for specifying or invoking a listing of communications equipment.

1 Claim 131 (New). The apparatus of claim 100 wherein said
2 communications engineering or network management application is
3 selected from the group consisting of wireless propagation models,

- 4 measurement tools, component placement or layout visualization tools,
- 5 optimization tools, bill of materials generating tools, and network
- 6 performance management or prediction tools.